

Amanda Weltman

CURRICULUM VITAE

June 2011

Nationality - South Africa and United States of America

Languages - English, Afrikaans, Hebrew

Department of Mathematics and
Applied Mathematics
University of Cape Town
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Education

- **Doctor of Philosophy (PhD)** Physics, Columbia University, NY, USA, May 2007. Supervisor: Brian R. Greene. Thesis: *Études on Cosmological Moduli Dynamics*.
- **Master of Philosophy (MPhil.)** Physics, Columbia University, NY, USA, May 2004.
- **Master of Arts (MA)** Physics, Columbia University, NY, USA, May 2003.
- **Bachelor of Science Honours (BSc. Hons.)** Theoretical Physics with distinction, University of Cape Town, South Africa 2000.
- **Bachelor of Science (BSc)** degree with distinction and distinctions in both Majors; Physics and Applied Mathematics, University of Cape Town, South Africa, 1999.

Employment History

- **Senior Lecturer** Department of Mathematics and Applied Mathematics, University of Cape Town, 2011 - present. Excellence First Class 2009 - present.
- **Postdoctoral Research Associate** Centre for Theoretical Cosmology, Department of Applied Mathematics and Theoretical Physics, University of Cambridge, 2007 - 2009.
- **Mathematics Team Coach** Dalton School, New York City, USA. 2006 - 2007.
- **Graduate Research Associate** Department of Physics, Columbia University, 2003 - 2007.

Honours and Awards

- **Awarded the Meiring Naude Medal from the Royal Society of South Africa.** 2011

- Awarded the University of Cape Town “Faculty of Science Young Researcher Award”. 2010
- Awarded University of Cape Town College of Fellows “Young Researcher Award”. 2010
- Awarded National Women in Science award “Best Emerging Young Researcher in the Natural Sciences and Engineering”. Awarded by the Department of Science and Technology, South Africa, 2009.
- Promoted to Lecturer Excellence First Class category at University of Cape Town, 2009.
- Visiting Fellowship, Wolfson College, Cambridge, Lifelong.
- Awarded Center for Theoretical Cosmology Fellowship, Cambridge University, 2007 - 2009.
- Elected onto the South African Gravity Society Council. 2008 - present.
- National Aeronautics and Space Administration (NASA) Graduate Student Research Fellowship. Project Title “A New Light on Dark Energy” 2005 - 2007.
- Pfister Fellowship for Theoretical Physics. Columbia University. 2003-2005.
- University of Cape Town Postgraduate Scholarship for Study Abroad. 2002-2004.
- Faculty Fellow in Physics at Columbia University. 2001-2003.
- Manual & Luby Washkansky Fellowship. 2001-2003. Top Science Faculty Honours student.
- Joseph Stone Scholarship. 2000. Top Physics undergraduate student.
- National Research Foundation Scholarship (Honours). 2000.
- University of Cape Town Entrance Merit Scholarship. 1997-1999.
- University of Cape Town Dean’s Merit List. 1997-1999.
- Yvonne Parfitt Trust National Scholarship. 1997 -1999.
- Podlashuk Bellinchamp National Trust Fellowship. 1997-1998.
- H.L Getz Trust Scholarship. 1997.
- Klein Scholarship Fund. 1997.
- Piketberg Fellowship Fund. 1997.
- Advocate Schach Scholarship. 1997.

Invited Talks

- Speaker at Institut D’Astrophysique de Paris, Astrophysics Seminar, **How to Build and Test Dark Energy Theories**, June 2010. (Reference: Dr G. Faye)

- Speaker at Fermilab National Laboratory, Astrophysics Seminar, January 2010, **Dark Energy and Where to find it** (Reference: Dr. W. Wester)
- Speaker at The First Johannesburg meeting on String Theory and Cosmology, December 2009, **Testing Dark Energy in the Laboratory** (Reference: Dr. K. Goldstein)
- Speaker at University of Nottingham, Cosmology Seminar, November 2008, **Hunting for Chameleons** (Reference: Dr. E. Copeland)
- Speaker at Modified Gravity on Cosmological Scales, Portsmouth, UK, 23 June 2008, **Testing Chameleon Dark Energy in the Laboratory** (Reference: Dr. B. Nichol)
- Speaker at 4th Patras Workshop on Axions, WIMPs and WISPs, DESY, Hamburg, Germany, 18-21 June 2008, **Hunting for Chameleons in ALP searches** (Reference: Dr. A. Ringwald)
- Speaker at 43rd Rencontres de Moriond: Cosmology, La Thuile, Italy, 15-22 Mar 2008, **Testing Chameleon Dark Energy in the Laboratory** (Reference: Dr. J. Dumarchez)
- Speaker at University of Cambridge, General Relativity Seminar, February 2008, **Hunting for Chameleons** (Reference: Dr. D. Seery)
- Speaker at University of Cape Town, Cosmology Seminar, September 2007, **A Wrinkle in Coleman De-Luccia** (Reference: Dr. A. Hamilton)
- Colloquium Speaker at University of Cape Town, Department of Mathematics and Applied Mathematics, December 2006, **Trapping Chaos** (Reference: Dr. C. Gilmour)
- Speaker at University of Cape Town, Cosmology Seminar, November 2006, **Cosmological Moduli Dynamics** (Reference: Dr. P. Dunsby)
- Speaker at CITA, Toronto, September 2006, **Aspects of Cosmological Moduli Trapping** (Reference: Dr. L. Kofman)
- Speaker at The First Cambridge - Mitchell Texas Conference at Cambridge University, August 2006, **Trapping Chaos** (Reference: Dr. N. Turok)
- Colloquium Speaker at Baylor University, Physics department, November 2005, **Chameleon Cosmology**. (Reference: Dr. J. Dittman)
- Speaker at University of Cape Town, Applied Mathematics department, August 2005, **Inflation in String Theory**. (Reference: Dr. C. Hellaby)
- Speaker at Workshop on Gravitational Aspects of String Theory, Fields Institute, Toronto, May 2005, **Effect of α' Corrections on Racetrack Inflation** (Reference: Dr. P. Kraus)
- Speaker at Columbia University Astrophysics Seminar, April 2005, **Brane Inflation**. (Reference: Dr. A. Crotts)
- Speaker at University of Toronto, Physics department, September 2004, **Chameleon Cosmology: Detecting Dark Energy in Orbit**. (Reference: Dr. A. Peet)
- Speaker at Institute for Strings, Cosmology and Astrophysics (ISCAP) at Columbia University, April 2004, **Chameleon Cosmology: Detecting Dark Energy in Orbit**. (Reference: Dr. P-S. Corasiniti)

- Speaker at African Summer Theory Institute (ASTI) summer school in Cape Town, South Africa, January 2004, **Chameleon Fields: Awaiting Surprises for Tests of Gravity in Space** (Reference: Dr. C.V. Johnson)
- Speaker at Superstring Cosmology Program, KITP, Santa Barbara, November 2003, **Chameleon Fields: Awaiting Surprises for Tests of Gravity in Space** (Reference: Dr. S. Carroll)
- Speaker at University of Cape Town, Applied Mathematics department, August 2003, **Chameleon Cosmology**. (Reference: Dr. G. F. R. Ellis)
- Speaker at Northwestern University, May 2001, **Neutrino oscillations and the 1994 LSND results**. (Reference: Dr. M. Velasco)

Professional Activities

- Visitor at Fermilab National Laboratory, Illinois, USA, January 2010.
- Attended **Foundations of Space and Time** conference, Stellenbosch, South Africa, 10 - 14 August 2009.
- Attended **The First Johannesburg meeting on String Theory and Cosmology**, Johannesburg, South Africa, December 2009.
- Attended 44th **Rencontres de Moriond: Very High Energy Phenomena in the Universe**, La Thuile, Italy, 1-8 February 2009.
- Attended **SIGRAV School in Cosmology and INFN Formation School**, Galileo Galilei Institute for Theoretical Physics, Florence, Italy, 26 - 29 January 2009.
- Attended **Applications of the AdS/CFT Correspondence**, Stellenbosch, South Africa, 4 - 9 December 2008.
- Attended **Modified Gravity on Cosmological Scales**, Portsmouth, UK, 23 June 2008.
- Attended 4th **Patras Workshop on Axions, WIMPs and WISPs**, DESY, Hamburg, Germany, 18-21 June 2008.
- Attended **New Horizons in Cosmology: Theoretical and Observational** workshop, May 2008, National Institute for Theoretical Physics (NITheP), Stellenbosch, South Africa.
- Attended 43rd **Rencontres de Moriond: Cosmology**, La Thuile, Italy, 15-22 Mar 2008.
- Elected on to the South African Gravity Society council, January 2008.
- Attended **South African Relativity Society** meeting at University of Cape Town, January 2008.
- Attended **SACOSMO** at the SAAO, South Africa, November 2007.
- Attended **Superstring Cosmology**, Trieste, July 2007.
- Attended The First Cambridge - Mitchell Texas Conference at Cambridge University **Time Dependent Backgrounds and the Cosmic Singularity in String and M Theory**, August 2006.

- Attended Les Houches Summer School - **Particle Physics and Cosmology: the Fabric of Spacetime**, August 2006.
- Attended **SACOSMO** at the University of the Western Cape, South Africa, July 2006.
- Attended **Frontiers in String Theory** at Banff International Research Station (by Invitation), February 2006.
- Attended **Theoretical Advanced Study Institute : The Many Dimensions of String Theory** Summer School at the University of Colorado at Boulder, June 2005.
- Attended **Cosmo - 04: International Workshop on Particle Physics and the Early Universe** at the Canadian Institute for Theoretical Astrophysics, September 2004.
- Attended **New Horizons in String Cosmology** at Banff International Research Station (by Invitation), July 2004.
- Participant at Superstring Cosmology Program, KITP, Santa Barbara (by Invitation). Sept- Dec 2003.
- Attended **Prospects in Theoretical Physics : Cosmology, Particles and Strings** Summer school at Institute for Advanced Study, Princeton, July 2003.
- Attended **The Gravitational Constant: Generalized Gravitational Theories and Experiments** Summer School at Erice, Sicily, May 2003.
- Attended **Prospects in Theoretical Physics : Introduction to String Theory** Summer school at Institute for Advanced Study, Princeton, June 2002.
- Attended 14th **Chris Engelbrecht Summer School : Strings, Quantum Gravity and Cosmology**, Stellenbosch, South Africa, January 2002.
- Attended **Supergravity at 25** Conference at C.N. Yang Institute for Theoretical Physics, Stonybrook, December 2001.
- Attended **The Early Universe and Cosmological Observations: a Critical Review**, Cape Town, South Africa, July 2001.
- Attended **Workshop on the Future of Higgs Physics**, Fermilab, May 2001.
- Attended **Fundamental Aspects of Modern and Applied Physics**, Luderitz, Namibia, November 2000.

Organisational Activities

Department and Faculty

- Elected Member of the **Executive Committee** for the **Astrophysics, Cosmology and Gravity Centre (ACGC)** at UCT, 2009 - present.
- Organiser of the Departmental **colloquium and seminar series**, 2010.
- Organiser of the Departmental **visitors programme**, 2010.
- Member of the Selection committee for the IT Officer, 2010.
- Member of the Science Faculty Board, 2007 - present.

- Member of **Student Parliament**, 2000.
- Member of the **Committee for Undergraduate Education in Science (CUES)**, 2000.
- Chairperson of **Science Students Council**, 1999 - 2000.

National and International

- Organiser of **Beyond the Concordance Model** workshop, Stellenbosch, South Africa, August 2010.
- Member of the **GammeV** and **GammeV CHASE** collaboration, Fermilab, Illinois, USA, 2007 - present.
- Elected member of the **South African Gravity Society Council**. 2008 - present.
- Member of the **MeerKAT** collaboration, University of Cape Town, SA. 2010 - present.
- Organiser of “**Foundations of Space and Time**” conference, Stellenbosch, South Africa, August 2009.
- Organiser of “**Applications of the AdS/CFT Correspondence - The Gauge Gravity Duality**”, Stellenbosch, South Africa, December 2008
- Organiser of “**New Horizons in Cosmology: Theoretical and Observational**” workshop, May 2008, National Institute for Theoretical Physics (NITheP)
- Organiser of **ISCAP seminar series**, Columbia University, 2005 - 2006
- Organiser of **Theoretical Physics Journal Club**, Columbia, 2004 - 2005
- Organiser of **TASI Journal Club**, University of Colorado at Boulder, June 2005
- Founding member and organiser of **African Summer Theory Institute (ASTI)** summer school in Cape Town, South Africa, January 2004.

Publications

Books and Chapters in books

1. **Foundations of Space & Time**, Book in publication with Cambridge University Press, Edited by J. Murugan, A. Weltman and Prof. G.F.R. Ellis. June 2010
2. **A Conversation in String Theory** Chapter in “Foundations of Space & Time” Book in publication with Cambridge University Press, A. Weltman, Dr. J Murugan and G.F.R. Ellis. June 2010
3. **The Problem with Quantum Gravity**, Chapter in “Foundations of Space & Time” Book in publication with Cambridge University Press, J. Murugan, A. Weltman and G.F.R. Ellis. June 2010
4. **Études on String Cosmology** Amanda Weltman, Book published by VDM Publishers, 2008.

Conference Proceedings

1. **Hunting for Chameleons in ALP searches** Amanda Weltman, September 2009, Conference proceedings in publication, e-Print Archive: **0809.4293 [hep-ph]** *Cited 1 time*
2. **Testing Chameleon models in the laboratory.** Amanda Weltman, Conference proceedings in publication, e-Print Archive: **0805.3461 [hep-ph]** *Cited 1 time*
3. **Chameleon Dark Energy** P. Brax, C. van de Bruck, A.C. Davis, J. Khoury, A. Weltman, *AIP Conf.Proc.736:105-110,2005*, e-Print Archive: **astro-ph/0410103** *Cited 16 times*

Peer-reviewed articles and in Press

1. **Anomalous coupling of scalars to gauge fields.** P. Brax, C. Burrage, A.C. Davis, D. Seery, A. Weltman. Oct 2010. e-Print Archive **1010.4536 [hep-th]** Published in *Phys.Lett.B699:5-9,2011*.
2. **Laboratory constraints on chameleon dark energy and power-law fields.** J. Steffen, A. Upadhye, A. Baumbaugh, A. Chou, P. Mazur, R. Tomlin, A. Weltman, W. Wester. Oct 2010 e-Print Archive **1010.0988 [astro-ph]** Published in *Phys.Rev.Lett.105:261803,2010*.
3. **Constraining chameleon field theories using the GammeV afterglow experiments.** A. Upadhye, J.H. Steffen, A. Weltman. Nov 2009. Published in *Phys.Rev.D81:015013,2010*. e-Print Archive **0911.3906 [hep-ph]**
4. **Higgs production as a probe of Chameleon Dark Energy.** Philippe Brax, Clare Burrage, Anne-Christine Davis, David Seery, Amanda Weltman. Nov 2009. Accepted, to Appear, *Phys.Rev.D* e-Print Archive **0911.1267 [hep-ph]**
5. **Collider constraints on interactions of dark energy with the Standard Model.**, Philippe Brax, Clare Burrage, Anne-Christine Davis, David Seery, Amanda Weltman, Published in *JHEP* 0909:128,2009. e-Print Archive: **0904.3002 [hep-ph]**
6. **A Search for chameleon particles using a photon regeneration technique** Aaron S. Chou et al, Jun 2008, Published in *Phys.Rev.Lett.102:030402,2009*, e-Print Archive: **0806.2438 [hep-ex]**
7. **Enhanced Brane Tunneling and Instanton Wrinkles** A.R. Brown, S. Sarangi, B. Shlaer and A. Weltman, *Phys.Rev.Lett.99:161601,2007*, e-Print Archive: **0706.0485 (hep-th)**
8. **Cosmological Moduli Dynamics**, B. R. Greene, S. Judes, J. J. Levin, S. Watson and A. Weltman, *JHEP* 0707:060,2007, e-Print Archive: **hep-th/0702220**
9. **An Effect of α' Corrections on Racetrack Inflation** B. R. Greene and A. Weltman, *JHEP03(2006)035*, e-Print Archive:**hep-th/0512135**
10. **Detecting Dark Energy in Orbit- the Cosmological Chameleon**, P. Brax, C. van de Bruck, A. C. Davis, J. Khoury and A. Weltman, *Phys.Rev.D70:123518, 2004*, e-Print Archive: **astro-ph/0408415**
11. **Chameleon Fields: Awaiting Surprises for tests of Gravity in Space**, J. Khoury and A. Weltman, *Phys.Rev.Lett.93:171104, 2004*, e-Print Archive: **astro-ph/0309411**
12. **Chameleon Cosmology**, J. Khoury and A. Weltman *Phys.Rev.D69:044026, 2004*, e-Print Archive: **astro-ph/0309300**

Advancement of Science

Outreach

1. **Science Expo Supervision** 2010. Medical testing in light of Bayesian Statistics - Gold medal and finalist at Nationals.
2. **Public Science Lectures** 2008 - 2010. 3 Visits to the Maharishi Institute in Vlodrop, The Netherlands to give a series of talks on Physics and Science methodology.
3. **Girls Science Day** 2004-2007. Planned and lead physics experiments for primary school girls brought in to visit Columbia University. 300 students per year.
4. **Guest lecturer for High School Honours Programme** 2002 - 2003. Prepared and delivered lectures in physics for advanced high school students at Columbia University. Topics include String Theory, Cosmology and General Relativity. 40 students.
5. **Physics Emasondosondo (Physics on Wheels - 4x4)** 2002. Was involved in founding the program from its inception. Helped design, develop and teach a physics program in the townships and rural areas of Gauteng as part of a Columbia University outreach initiative. Average of 150 students per school, 14 schools.

Popular Science Interviews and Publicity

1. Profiled for Destiny Magazine **The Power of 40** About 40 women under 40 excelling in their fields. November 2010
2. Profiled for The Mail and Guardian - **Blazing a path for young scientists**. 5 November 2010
3. Front cover article New Scientist magazine **Chameleon Cosmos**. 31 July 2010.
4. Article in Fair Lady South Africa magazine. May 2010.
5. **UCT Physicist is best emerging woman scientist**, UCT Monday Paper, 14-27 September 2009.
6. **2009 South African Women in Science Awards**, Physics Comment, September 2009.
7. **Best Emerging Young Scientist Award**, DSTbulletin, September 2009.
8. **Dark Energy Particle spotted?**, Nature, News Article. 29 May 2009.
9. **Chameleon Particle blends into the background**, Physicsworld.com, News article. 10 February 2009.
10. **GammeV: The little experiment with big output**, Fermilab Today, Feature article. 6 February 2009.
11. **A probe of the particle nature of dark energy**, Fermilab Today, Fermilab Special Result of the Week. 6 February 2009.
12. **Brane Trust: Tunneling and Stringy Physics**, Physorg.com, News article. 30 October 2007.
13. **Has the Dark Energy particle been spotted?**, New Scientist, News article. 18 July 2007.